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| 10/540,575  | 06/24/2005  | Aya Imada            | 03500.017887.       | 6416             |
| 5514 7590 02/19/2009<br>FITZPATRICK CELLA HARPER & SCINTO<br>30 ROCKEFELLER PLAZA<br>NEW YORK, NY 10112 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| OLSON, JASON C  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 2627  |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/540,575

**Applicant(s)**

IMADA ET AL.

**Examiner**

JASON C. OLSON

**Art Unit**

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 3 is objected to because of the following informalities: the term "the boundary" in line 5 should be "a boundary". Appropriate correction is required.

Claim 6 is objected to because of the following informalities: the units of B should be written out, i.e., nanometers. Appropriate correction is required.

Claim 20 is objected to because of the following informalities: the units of A and B should be written out, i.e., volts and nanometers respectfully. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 4, 6, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the shared region" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the shared region" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the above described plurality of types of periodic array structures". This limitation renders the claim indefinite. It does not have antecedent basis in the claim or in the written description. Furthermore, the term "the above" does not limit any structure in the claim or does not define any functionality of the claimed structure. Claim 6 also recites the limitation "0.75B to 1.5B where B is a numerical value [nm]". The examiner is confused to the meaning of B. Are the numbers 0.75 and 1.5 multiplied by B, which is a value in nanometers or is B simply the units of the range, i.e., 0.75 nm to 1.5 nm. If B is a multiplied by 0.75 and 1.5, then the range of

B needs to be defined. Otherwise, the variable B will be undefined as well as the range. That is, B cannot be zero or any number such as infinity. The examiner is unable to determine the scope of the claimed invention, thus the claim is indefinite.

Claim 20 recites the limitation "said plurality of periodic arrays is A [V] (B [nm] = A [V] /2.5 [V/nm], where B is a numerical value included within the range between a maximum value and a minimum value....). The use of parenthesis renders the claims indefinite because the examiner is not sure if the statement in parenthesis is included or excluded from the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10, 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Okubo et al. (JP 11224422 A), hereafter "Okubo", translation provided.

Regarding claim 1, Okubo teaches a first area including a plurality of pores which have a first period (Drawing 6, servo area TA and TB) and a second area including a plurality of pores which have a second period (Drawing 6, Sync area S), characterized in that the first area and the second area share a plurality of pores (Drawing 6, the boundary between Sync S and Servo TA or TB share a plurality of pores in Sync S).

Regarding claim 2, Okubo teaches periodic array structures of pores formed in an anodized oxide film (Drawing 4 and corresponding description), wherein a plurality of types of periodic array structures are arranged adjacent to one another (Drawing 6 array S and array Ta or Tb).

Regarding claim 3, Okubo teaches a plurality of types of the periodic array structures are arranged adjacent to one another and there are at least two pores in the shared region which constitutes the boundary thereof (Drawing 6, the boundary between Sync S and Servo TA or TB share a plurality of pores in Sync S).

Regarding claim 4, Okubo teaches a plurality of types of the periodic array structures have at least one pore in addition to the pores in the shared region (Drawing 6, the boundary between Sync S and Servo TA or TB share a plurality of pores in Sync S).

Regarding claim 5, Okubo teaches a plurality of types of the periodic array structures each have equal distances between first proximate pores or have the distance between first proximate pores on one side equal to the distance between second proximate pores on the other side or have equal distances between second proximate pores (Drawing 6; TA and TB have equal distance between first proximate pores and S has equal distance between first proximate pores).

Regarding claim 7, Okubo teaches said periodic array structures is a rectangular lattice, tetragonal lattice, hexagonal lattice, graphite-shaped lattice or parallelogram lattice (Drawing 6, TA and TB form a hexagonal lattice and S and S form a rectangular lattice).

Regarding claim 8, Okubo teaches said anodized oxide film is comprised of aluminum as a principal component (Drawing 4, aluminum 31).

Regarding claim 9, Okubo teaches at least one of said pores includes a filler (see par. [0031], ln. 1-2).

Regarding claim 10, Okubo teaches said filler is a dielectric having a dielectric constant different from that of said anodized oxide film, semiconductor, magnetic material or light-emitting material (see par. [0031], ln. 1-2; the metallic magnetic substance has a different dielectric constant than a light-emitting material).

Regarding claim 13, Okubo teaches a magnetic device wherein said pores of the structure according to claim 2 are filled with a magnetic material see par. [0031], ln. 1-2).

Regarding claim 14, Okubo teaches a data area where pores filled with said magnetic material to record information; and a servo area where track positions are detected, wherein the structure made up of simple periodic arrays of said pores differs between said data area and said servo area (Drawing 6 and corresponding description illustrates a data area with pores for magnetically recording information and a servo area with pores different from the data area).

Regarding claim 15, Okubo teaches at least one pore in said servo area is shifted by half a period with respect to the period of pores perpendicular to the track direction in the data area (Drawing 6).

Regarding claim 16, Okubo teaches said servo area is constructed of at least two types of periodic array structures (Drawing 6, sync array S and servo mark array Ta and TB).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo.

Regarding claim 6, Okubo teaches all the limitations of the claim except: the distance between the most proximate pores of a plurality of types of the periodic array structures is 0.75 B to 1.5 B where B is a numerical value [nm] included within the range between a maximum value and a minimum value of the distance between the most proximate pores of the above described plurality of types of periodic array structures. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to position the most proximate pores of a plurality of types of the periodic array structure at 0.75B to 1.5B, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo in view of Applicant Admitted Prior Art, hereafter "AAPA".



Okubo is relied upon to teach a magnetic storage device comprising pores of a plurality of arrays as described above. Okubo fails to teach an optical device wherein the pores are filled with a dielectric having dielectric constant different from that of said anodized oxide film and a light-emitting device wherein said pores are filled with a light-emitting material. However, AAPA is relied upon to teach creating optical devices and light-emitting devices with pores (see page 3, ln. 1-11; the pores of the optical device are filled with a dielectric with a constant different that anodized oxide film).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Okubo and apply them to an optical device and a light-emitting device as theses are considered equivalent technologies to store data.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo in view of Masuda et al. (U.S. Pat. 6,139,713), hereafter "Masuda".

Regarding claims 17-20, Okubo teaches a method of manufacturing a structure in which a plurality of pore periodic array structures formed in an anodized oxide film having different periods are arranged adjacent to one another (Drawings 4 and 6 and corresponding descriptions), comprising: a step of forming pore starting points made up of a plurality of types of periodic arrays on the surface of a substrate comprised of aluminum as a principal component (Drawing 4, step (a) and corresponding description); and a step of anodizing said substrate (see par. [0026], ln. 6-8); a plurality of types of the periodic array structures are arranged adjacent to one another and there are at least two pores in the shared region which constitutes the boundary thereof

(Drawing 6, the boundary between Sync S and Servo TA or TB share a plurality of pores in Sync S); and a plurality of types of the periodic array structures have at least one pore in addition to the pores in the shared region (Drawing 6, the boundary between Sync S and Servo TA or TB share a plurality of pores in Sync S).

Okubo fails to disclose that that anodizing is done simultaneously at the same anodization voltage and that a voltage applied during anodization of the structure of said plurality of periodic arrays is  $A [V]$ ,  $B [nm]=A [V]/2.5 [V/nm]$ , where B is a numerical value included within the range between a maximum value and a minimum value of the distance between the most proximate pores included in said plurality of types of periodic array structures. However, Masuda is relied upon to teach manufacturing porous anodized alumina film by constant-voltage anodizing (col. 8, lns. 41-43, 62-64, and col. 9, ln. 19-22) and that "The interval between the pores of the porous anodized alumina film is proportional to the voltage in anodizing, i.e., the anodizing voltage(anode oxidation voltage), and it is known that the proportional constant is about 2.5 nm/V" (see par. 5, ln. 66-col. 6, ln. 6). Okubo further teaches that the hexagonal array is formed corresponding to ranges of voltages (see col. 6, ln. 7-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the forming method of Okubo by applying the teaching of a constant-voltage anodizing to create porous arrays as taught by Masuda for the purpose of forming satisfactory close packed arrays.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON C. OLSON whose telephone number is (571)272-7560. The examiner can normally be reached on Monday thru Thursday 7:30-5:30; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph H. Feild can be reached on (571)272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason C Olson/  
Primary Examiner, Art Unit 2627